



**Case study:
Baptist Health
South Florida**

Deploying an on-site VoWiFi
communications system

VoWiFi speeds communication between hospital staff and gives patients a direct line to care providers

To enhance its quality of patient care, Baptist Health South Florida has taken communications beyond VoIP to VoWiFi. Staff can now make and receive calls on the move, communicate with each other and their patients and receive e-mails, text messages and alerts with one wireless handset.

The challenge ■■

Baptist Health South Florida (BHSF) is the largest not-for-profit healthcare organization in the region. For more than four decades, BHSF has blended old-fashioned “good doctoring” with the finest in technological innovation. In an effort to better serve its patients and its staff, BHSF began investigating replacement communications equipment for its aging SpectraLink system, which, after five years, was plagued with handset failures and costly repairs. At the same time, BHSF needed increased messaging capability and the ability for staff to carry the same on-site wireless handset to multiple hospitals.

The solution ■■

With the expert help of Presidio Networked Solutions, the nation’s fastest growing value-added solutions provider, BHSF is deploying Voice over WiFi (VoWiFi). VoWiFi is a Wi-Fi-based VoIP service. Where VoIP consists of the hardware and software that enables IT personnel to employ the Internet as the transmission medium for telephone calls, VoWiFi is the wireless version of this technology and is designed to work on wireless devices such as laptops, PDAs or, in this case, portable handsets.

The results ■■

Medical and administrative staff have complete two-way messaging capability, including e-mail, voicemail and text capabilities with them at all times. They can communicate with each other from anywhere in the building using a compact handset designed specifically to withstand the physical demands of the hospital environment. BHSF has seen a dramatic increase in patient response times and a significant reduction in maintenance and repair costs. Messaging, patient monitoring, reporting and patient flow have all seen dramatic improvements with VoWiFi.

Company: Baptist Health South Florida

Location: Coral Gables, Florida

Profile: Baptist Health South Florida is the largest not-for-profit healthcare organization in the region.

With charge of eight hospitals in the region, BHSF offers a variety of healthcare services, including outpatient diagnostic and treatment facilities and home healthcare, and treats more than 100,000 people each year.

Revenue: \$1.6 billion

Presidio simplifies communications for Baptist Health South Florida (BHSF)

Time is a precious commodity in a hospital environment. Quick responses, clear communication and accurate documentation are critical aspects of patient treatment. Offering a dynamic blend of leading-edge medical care, BHSF is the region's largest not-for-profit healthcare organization, serving more than 100,000 patients each year. Despite its recognition as a national leader in medicine, BHSF's five-year-old SpectraLink telephone and messaging infrastructure needed an overhaul.

After evaluating needs and comparing product offerings, BHSF recognized the time savings and communications benefits of a VoWiFi system. And with the help of Presidio Networked Solutions, BHSF is implementing VoWiFi across its eight-hospital organization.

A hospital can be a brutal environment for communications equipment. Doctors, nurses and administrative staff are constantly on the move, yet it's imperative that they communicate with each other. When purchased, the SpectraLink telephone system was one of the best options on the market. But as BHSF's mobile communications equipment aged and usage demands increased, more and more repairs became necessary and battery life diminished.

In many cases, phones were breaking and users were using tape or rubber bands to hold them together to avoid the inconvenience of stopping by the IT department to swap out handsets. Above all, the older SpectraLink system simply couldn't offer the increased messaging capacity found in a new VoWiFi system.

Presidio's installation of a new VoWiFi system employing a Cisco Systems wireless network with an Ascom FreeNET VoWiFi Gateway and i75 handsets resulted in a massive reduction in failed mobile telephones and a more fluid information exchange within and between departments.

How on-site VoWiFi improves communication

VoWiFi allows hospitals to deploy an on-site wireless voice communication system across their wireless data network without purchasing a broadcast license from the Federal Communications Commission (FCC) or paying monthly bills for cellular service.

BHSF's goal with VoWiFi was to simultaneously increase its staff's mobility and its ability to communicate. The new VoWiFi system allows staff to remain mobile while allowing them to take and make calls as if they were still at their desks. This "talk before you walk" capability enables a mobile primary caregiver to accept a patient's call no matter where on the floor they are, speak directly with the patient and immediately assess the patient's needs.

"Talk before you walk" capability also significantly reduces a nurse's workload and saves the time spent traveling to and from a central station to address patients' requests. Another benefit is that if a doctor leaves one hospital and travels to another, the same handset will work on the wireless networks at the destination hospital.

The implementation of VoWiFi at BHSF has made an already great hospital even better. With the VoWiFi system:

- Doctors can be reached on the same phone at all BHSF hospitals
- Patients get better, faster service
- Workflow and patient flow are streamlined
- Integrated messaging features allow medical staff to interact with each other more effectively
- Communications reliability has increased
- Maintenance costs are lower



Choosing and implementing VoWiFi

When the time came to step up to the messaging capabilities of a VoWiFi network, Presidio began the project with an in-depth site survey, product analysis and field trials. During the field trials, BHSF evaluated most of the leading VoWiFi vendors — Nortel, Vocera Communications, Avaya, Siemens and Ascom — to test and demonstrate their on-site wireless communication systems on their Cisco Systems wireless network. It was immediately clear that the Ascom system was not only compact, but easy to integrate and use. BHSF quickly realized the strength of the system's "any-to-any" messaging platform, which allows a message to be delivered by voice, e-mail or application.

At the conclusion of the trial, BHSF chose Ascom for the VoWiFi deployment at all their hospitals, specifically choosing the Ascom i75 handset based on its robust design, extensive feature set, telephony performance, battery life and message integration capability.

With the product decision made, Presidio coordinated the product purchase, built the project plan, constructed the system and implemented it. At this time, approximately 500 handsets have been deployed at two hospitals and approximately 1,500 additional handsets will be deployed by the end of 2007 at all remaining BHSF hospitals.

Technical design of the wireless network

The first step to installation of VoWiFi at BHSF hospitals was to ensure that a robust wireless infrastructure was in place. Once a wireless infrastructure was in place, the VoWiFi system could be installed and run on it.

After examining all the options Presidio provided, BHSF chose a Cisco Systems wireless network as the foundation for their VoWiFi network. Then they chose to install an Ascom FreeNET VoWiFi Gateway system on top of the Cisco infrastructure for PBX connectivity.

The Cisco Systems 6509 wireless core that BHSF employs communicates through a dedicated VoIP VLAN over a private fiber optic backbone that uses an Ethernet service linked to the main network. To ensure Quality of Service (QoS), voice packets are classified throughout the entire network as high priority.



“We needed an on-site wireless communication system that would provide us seamless mobility throughout our entire hospital chain. The easy integration of Ascom’s voice and messaging system over our Cisco Systems wireless infrastructure was exactly what we were looking for.”

– Gilberto Albornoz, Director of Telecom and Network Infrastructure, BHSF



One of the modules in the Cisco Systems 6509 wireless core is the Wireless LAN Solution Engine (WLSE), a controller that helps manage the Access Points (APs) with the autonomous Cisco Internetwork Operating System (IOS) software. At the Homestead Hospital, the exception is a Wireless Service Module (WiSM) that is the controller for the access points with the Lightweight Access Point Protocol (LWAPP) IOS. Both LWAPP IOS and Cisco IOS decrease operational costs by allowing centralized control of access, security and QoS at the WLAN instead of each individual AP.

The Cisco Systems Catalyst 3750 switches provide the connection and Power-over-Ethernet (POE) to the APs. Their ports are configured with all the necessary trunks and VLANs to support each service set identifier (SSID) from the access points. And all switches are powered through an uninterruptible power supply (UPS) to provide maximum uptime.

The Cisco Aironet 1242AG access points are loaded with the autonomous IOS except for the ones at Homestead Hospital, which use the LWAPP IOS. The access points provide the wireless SSIDs and VLANs for the secure clinical networks, general use access network and the VoWiFi network.

Addition of VoWiFi to the wireless network

Once the wireless network was in place, the addition of the Ascom VoWiFi components was straightforward. Presidio installed the Ascom FreeNET VoIP Gateway, which integrates seamlessly with a circuit-switched PBX or public switched telephone network (PSTN) to provide high-quality voice communication between the Ascom FreeNET portable handsets and any other telephone. Containing two T1 or E1 interfaces, the VoIP Gateway supports QSIG, NI-2, 5ESS, DMS100 ISDN and E&M CAS protocols, in addition to performing handset registration and call routing to optimize channel usage.

The FreeNET VoIP Gateway is stacked to optimize the grade of service to the PBX while maintaining a single browser-based management application. An integrated message server allows seamless integration with the Ascom UNITE Messaging Suite. This, in turn, allows the Ascom Communications Server to provide a complete audit trail while transmitting and receiving messages.

As an integral part of the Ascom FreeNET VoWiFi communications solution, the i75 Medic portable handset provides communication with other on-site and off-site telephones. Used in combination with the Ascom UNITE Messaging Suite, the i75 Medic portable handset also provides a two-way messaging interface with clinical information systems and nurse call systems. Handset updates can be performed over the air or by using the USB cradle through a software application called the Ascom Portable Device Manager (PDM).

VoWiFi's return on investment (ROI)

In hospital applications, VoWiFi has delivered significant cost and time savings. In one documented instance, a hospital saved more than 10,000 hours across all departments over the course of a year, and BHSF is expecting similar returns.

But when evaluating investments for healthcare, a strictly quantitative approach doesn't work. In a healthcare context, the definition of ROI must include other equally important measures, such as service to patients and quality of care. BHSF employees overwhelmingly believe the installation of this solution has helped simplify their jobs and increased their ability to provide top-notch patient care. Centralized

management provides quicker patient-response times. Network maintenance is more cost effective. And with fewer devices to manage and maintain across the enterprise, overburdened IT departments are feeling some relief.

VoWiFi integrates with multiple applications

With the help of Presidio Networked Solutions, BHSF is currently rolling out the basic VoWiFi telephony. BHSF will eventually integrate medical applications with the system through special small gateway appliances that will enable notification of medical staff when test results are ready or critical thresholds are exceeded.



“We’ve already seen tremendous increases in response times to patient calls. As new patient-treatment systems come online in the future, we’ll integrate their warning and messaging features into the VoWiFi solution. And we can count on Presidio to bring those capabilities online as they become necessary and available.”

– Gilberto Albornoz, Director of Telecom and Network Infrastructure, BHSF



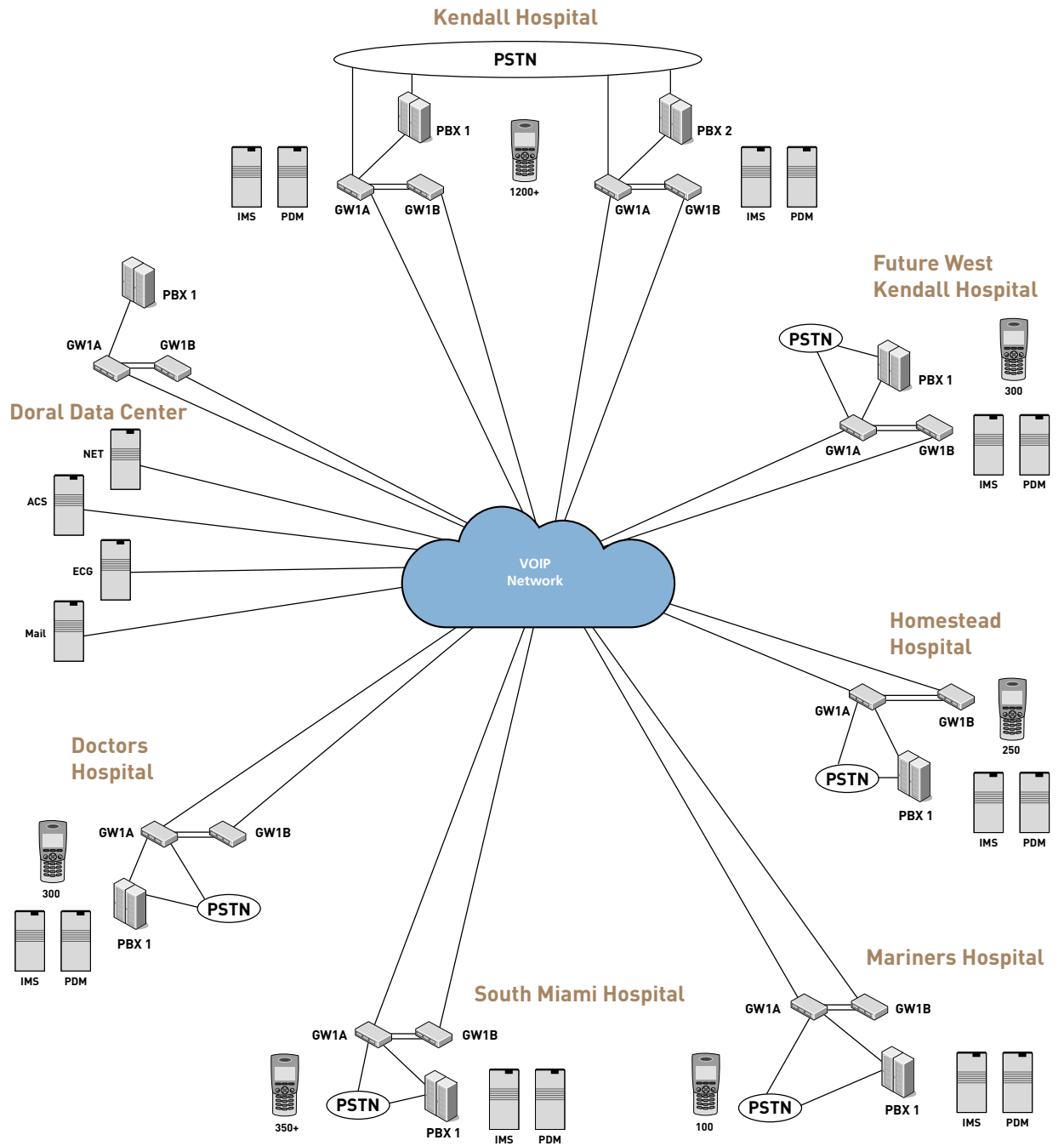
The future of VoWiFi in hospitals

VoWiFi has a promising future in the medical field. As hospitals update their networks and VoWiFi comes online, medical applications will progressively integrate with VoWiFi systems.

As more and more capabilities transfer over to the Ascom i75 handheld from notebook and desktop computing and hospital-specific alert systems, medical staff will see a reduction in the amount of time they have to spend at their desks and an increase in the amount of time they can spend providing quality healthcare.



BHSF onsite VoWiFi



Once installed on the existing circuit-switched PBX or public-switched telephone network (PSTN) and wireless network, the Ascum FreeNET VoIP Gateway interacts with the Ascum i75 Mobile Handset, UNITE Messaging Suite and Portable Device Manager to allow mobile communication across the entire network. For redundancy, BHSF chose to install two Ascum FreeNET VoIP Gateways on the Cisco Systems wireless network at each hospital.

Product information

BH-6509-Wireless Core

The Cisco Catalyst 6509 provides maximum uptime with redundancy and rapid (1 to 3 seconds) stateful failover across supervisor engines. It supports modular Cisco IOS Software to minimize unplanned downtime through self-healing processes and simplifies software changes through subsystem in-service software upgrades. The Cisco Catalyst 6506-E supports all Cisco Catalyst 6500 Series modules, including:

- Supervisor engines
- Fast Ethernet modules (with IEEE 802.3af Power over Ethernet [PoE])
- Gigabit Ethernet modules (with IEEE 802.3af PoE)
- 10 Gigabit Ethernet modules
- Flex WAN modules
- Shared Port Adaptors/SPA Interface Processors
- Multi-Gigabit services modules (content services, firewall, intrusion detection, IP Security [IPSec], VPN, network analysis, and Secure Sockets Layer [SSL] acceleration)
- The Cisco Catalyst 6506-E supports both Cisco Catalyst OS and Cisco IOS Software. Cisco Catalyst 6506-E supports up to a 6000W power supply, thus providing the ability to support a large number of IEEE 802.3af PoE devices.

Cisco Catalyst 3750 switch

Featuring Cisco StackWise technology, the Cisco Catalyst 3750 series switch improves LAN operating efficiency by combining ease of use and the highest resiliency available for stackable switches. A new standard in stackable resiliency, Cisco StackWise technology brings high levels of resiliency, automation and performance to stackable switches. With Cisco StackWise technology, customers can create a single 32-Gbps switching unit with up to nine Cisco Catalyst 3750 Series switches.

- Stackable, fixed-configuration switches with Cisco StackWise™ technology and a 32-Gbps interconnect for a unified, resilient system of up to nine switches
- Layer 2-4 switching and intelligent services with dynamic IP routing and IPv6
- Fast Ethernet, Gigabit Ethernet, and 10 Gigabit Ethernet connectivity
- Up to 48 10/100/1000 ports, plus 4 Small Form-Factor Pluggable (SFP) ports per stackable switch
- Integrated Power over Ethernet (PoE) (Cisco pre-standard and IEEE 802.3af); up to 24 ports with 15.4 watts (W) or 48 ports with 7.3W
- Integrated wireless LAN controller supporting up to 200 access points
- AC power supply failure protection with external redundant power supply

Cisco Aironet 1242AG Access Point

This dual-band access point is designed with dual diversity antenna connectors for challenging RF environments.

Features include:

- Two high-performance IEEE 802.11a and 802.11g radios offering 108 Mbps of capacity
- 2.4 and 5 GHz dual-diversity RP-TNC connectors for external antenna support
- Rugged metal case
- 32 MB of memory with 16 MB of storage
- Inline power support (Cisco pre-standard and 802.3af)
- Console port for management
- Support for the Cisco Self-Defending Network, NAC, WPA and 802.11i/WPA2
- UL2043-rated for placement in plenum areas
- Comes with integrated and secure mounting system



Product information (continued)

Ascom FreeNET VoIP Gateway IP600

The FreeNET VoIP Gateway IP600 enables seamless integration with a circuit-switched PBX or public switched telephone network (PSTN) to provide high-quality voice communication between FreeNET portable handsets and any other telephone. The compact FreeNET VoIP Gateway IP600 is approximately the size of a book, contains no moving components and can be stacked to optimize the grade of service to the PBX while maintaining a single browser-based management application.

The Ascom IP600 Gateway supports the following IEEE standards:

- **IEEE 802.11b** — These devices operate in the unlicensed ISM band of 2.4 to 2.4835 GHz with a maximum theoretical bandwidth of 11 Mbit/s.
- **IEEE 802.11g** — These devices operate in the unlicensed ISM band of 2.4 to 2.4835 GHz with a maximum theoretical bandwidth of 54 Mbit/s and are backward compatible with 802.11b networks.
- **IEEE 802.11e (QoS)** — Quality-of-service is the control of bandwidth and traffic loss. The 802.11e specification adds QoS to WLANs by prioritizing data, voice, video and audio transmissions and also specifies enhanced error-correcting mechanisms in the Media Access Control (MAC) layer to improve delay-sensitive voice traffic.
- **IEEE 802.11i (Security)** — This standard consists of Wi-Fi Protected Access (WPA) and Robust Security Network (RSN). WPA uses Temporal Key Integrity Protocol (TKIP) to improve security cipher keys. RSN uses dynamic negotiation of authentication and encryption algorithms between APs and mobile devices.

Ascom i75 Portable Handset

Designed specifically for healthcare environments, the rugged Ascom i75 Medic portable handset features an intuitive user interface with a large display and a four-way navigation button.

- Large graphical display, intuitive GUI, illuminated display and keypad
- Three customizable soft keys and navigation button
- Vibration alert, hands-free and loudspeaker
- Interactive messaging with a limit of up to 500 characters per message
- "Virtual SIM" & "Over Air" updates
- Local and central phonebook
- "Over Air" software updates
- Stores 20 messages
- Message displays instantly with large font and inverted text
- Mobile alarms and data: push button, no-movement and man-down
- Advanced clinical integration
- Message prioritization in queue end-to-end
- Three priority levels for messages with distinct tones
- Instant notification while on active call with priority
- Enhanced Push-to-Talk

Ascom UNITE Messaging Suite

The UNITE Professional Messaging Suite connects mobile hospital staff to the information systems inside the hospital. Alerts and alarms can be delivered directly to the mobile device of the appropriate staff member while providing a complete audit trail. UNITE can deliver messages to wireless handsets, pagers or wide-area devices such as cellular phones, PDAs and BlackBerrys.

- Allows delivery of interactive, time-critical information directly to personal handsets as voice, text, alarms or data
- Offers smart integration with a wide array of data systems
- Provides a robust messaging integration solution consisting of small network appliances with Ascom software applications
- Optimizes information flow and capitalizes on existing technology investments
- Delivers efficient patient flow and increased productivity

Ascom Portable Device Manager (PDM)

The Ascom PDM is a software application that simplifies administration by allowing firmware updates via a USB cradle or over-the-air. Users can utilize any FreeNET portable handset to access their personal configuration settings. And because each user's data is centrally stored, configuring and changing out handsets are quick, easy tasks.

- Offers simplified administration through an easy-to-use graphical user interface (GUI)
- Allows firmware updates via a USB cradle or over-the-air
- Allows quick and easy configuration of handsets

Call 1-800-4LAN-WAN for more information about Presidio solutions and technologies.

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The company represents leading technology innovators:

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- IBM Premier Partner
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